Occupational Covid-19 hazard in Austria: Are women really more exposed?

Nadia Steiber & Raya Muttarak
Outline

• Background 1: Covid-19 as an occupational hazard
• Background 2: Risk perception and gender#migrant background
• Survey data and results
  • Which sectors of the economy are associated with high perceived risk?
  • Does the perceived risk vary with the age and qualification level of employees?
  • Migrant background as a risk factor?
  • Are women more at risk? Risk perception versus actual hazard
Covid-19 as an occupational hazard

• **Theory**: Which occupations have the highest potential exposure to the coronavirus (COVID-19)? Two correlated factors (ONET – US Department of Labor and ONS – UK Office for National Statistics):

  • Exposure to disease (generally)
  • Physical proximity with others
Covid-19 as an occupational hazard

Theory

Healthcare workers are exposed to disease on a daily basis and require close contact with others.

Covid-19 as an occupational hazard

Theory

Some elementary occupations less exposed to disease, but do require close contact with others

Sales and retail assistants (in blue)

Covid-19 as an occupational hazard

• **Theory**: Who is working in those high-risk occupations?

  • Overrepresentation of women
  • Overrepresentation of groups with minority ethnic background
  • Overrepresentation of low paid workers

= “essential” workers
Covid-19 as an occupational hazard

• Evidence:
    • Caveat 1: deaths rates not informative about differential infection risk (e.g. women equally likely to get infected, but less likely to die from Covid-19)
    • Caveat 2: data reflects where people work, not where or how they got infected

  • First study to correlate the occupational risk factors proposed by ONS and the US Department of Labor to **actual data on COVID-19 infections** (Zhang 18 Nov 2020).
    • Caveat 2: data reflects where people work, not where or how they got infected
Covid-19 as an occupational hazard

Sobotka et al. (2020): Based on data for 10 countries, they find a gender-neutral distribution of confirmed COVID-19 cases, but among people of working age, women diagnosed with COVID-19 substantially outnumber infected men.

Their hypothesis in conclusion:

“The higher burden of COVID-19 infections among women of prime working ages reflects their high representation in professions that are particularly exposed to the disease.”

Evidence for Austria: in core working age groups (esp. ages 45-54) more female than male cases of Covid-19 (due to differential occupational exposure? Caveat 2).
Aim of this study

- Occupational hazard would ideally be measured in terms of actual infections combined with information on the occupations of those infection and on where infection took place.
  - Such data is not available
- Our focus: perceived occupational hazard (=context specific measure)
  - Survey data on perceived infection risk at work
  - Advantage: context-specific measure, focus on risk at workplace
  - Potential disadvantage: subjective risk assessment (cognitive bias)
- Aims: investigation of differences in risk assessment across groups (across occupations and within comparable occupational settings)
Risk perception and gender#ethnicity

• **Theory**: A substantial body of **risk research** indicates that women and men differ in their perceptions of risk (Gustafson 1998).
  • Social theories of gender: gendered practice giving rise to systematic gender differences in the perception of risk
    • Masculine norms that valorize bravery and strength
    • Feminine norms that valorize protection and nurturing
    • “women constantly worry a bit more” (Gustafson 1998: 806)
  • Intersection of gender and ethnicity: **“white male effect”** whereby men tend to perceive lower risks compared to women and ethnic minorities (Marshall 2004).
    • **“Social inequality effect”** instead of a “white male effect” (Olofsson & Rashid 2011)
Covid-19 risk perception and gender

• **Evidence:** Dryhurst et al. (2020): Risk perceptions of COVID-19 around the world. *Journal of Risk Research.*

  • **Covid-19 risk perception measured as an index,** covering affective, cognitive, and temporal-spatial dimensions
  • UK, USA, Australia, Germany, Spain, Italy, Sweden, Mexico, Japan, and South Korea.
    • Data collection mid-March to mid-April 2020, online surveys
  • Finding: **males perceive less risk compared to females** (pooled sample) controlling for knowledge and direct experience (but in country-by-country analysis only Germany, Spain and the UK, in all other countries, no gender difference)
Survey data

AKCOVID-Survey:

• representative survey of 2,000 persons living in Austria
  • Sample of analysis: 1,522 employed persons
  • 481 persons with experience of short-time work
  • 905 families with children aged <18, among which 421 with children <6

• fieldwork: June 2020 (CATI & CAWI) – follow-up planned for January 2021

• Topics: risk perception at workplace, social and economic consequences of the pandemic for families, changes in working conditions, mental health, unmet health care needs, etc.
Survey data

Number of registered Covid-19 infections in Austria

Fieldwork: 18 June-2 July
Survey data

• Central item for this study

“Wie hoch schätzen Sie das Risiko ein, dass Sie sich im Rahmen Ihrer beruflichen Tätigkeit mit dem Corona-Virus anstecken?”
(sehr hoch, eher hoch, eher niedrig, sehr niedrig)

“How high do you estimate the risk that you will get infected with the Corona virus at work?”
(very high, rather high, rather low, very low)
Results

About a quarter of employed respondents estimated their occupational Covid-19 hazard as (very) high – 26% of women and 24% of men.

"How high do you estimate the risk that you will get infected with the Corona virus at your workplace"?

<table>
<thead>
<tr>
<th></th>
<th>very high</th>
<th>rather high</th>
<th>rather low</th>
<th>very low</th>
<th>don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>6%</td>
<td>20%</td>
<td>37%</td>
<td>33%</td>
<td>5%</td>
</tr>
<tr>
<td>Women</td>
<td>7%</td>
<td>19%</td>
<td>35%</td>
<td>33%</td>
<td>6%</td>
</tr>
<tr>
<td>Men</td>
<td>4%</td>
<td>20%</td>
<td>39%</td>
<td>33%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Sample: 1,522 employed persons, weighted.
Chart: Nadia Steiber • Source: AKCOVID Survey 2020, data collected in June 2020 • Created with Datawrapper
Results

Perceived risk of infection with the Corona virus, by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Very high</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>13%</td>
<td>33%</td>
</tr>
<tr>
<td>Health/Care</td>
<td>10%</td>
<td>29%</td>
</tr>
<tr>
<td>Retail</td>
<td>9%</td>
<td>26%</td>
</tr>
<tr>
<td>Tourism/catering</td>
<td>7%</td>
<td>22%</td>
</tr>
<tr>
<td>Transporting/storage</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Financial/insurance activities</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Public administration</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Professional/scientific/technical activities</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4%</td>
<td>16%</td>
</tr>
<tr>
<td>Information/communication</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>Construction</td>
<td>13%</td>
<td></td>
</tr>
</tbody>
</table>

“high risk sectors”

“low risk sectors”

Sample: 1,252 employed persons. Predicted probabilities based on an ordered logistic regression that controls for gender, age, education, Austrian citizenship and NUTS-2 region.
Results

Perceived risk of infection with the Corona virus, by sector

- Education: 13% very high, 33% high
- Health/Care: 10% very high, 29% high
- Retail: 9% very high, 26% high
- Tourism/catering: 7% very high, 22% high
- Transporting/storage: 6% very high, 20% high
- Financial/insurance activities: 6% very high, 20% high
- Public administration: 6% very high, 20% high
- Professional/scientific/technical activities: 6% very high, 20% high
- Manufacturing: 4% very high, 16% high
- Information/communication: 4% very high, 14% high
- Construction: 13% very high

Share of female employees, by sector

- Education: 71%
- Health/Care: 76%
- Retail: 56%
- Tourism/catering: 60%
- Transporting/storage: 22%
- Financial/insurance activities: 52%
- Public administration: 49%
- Professional/scientific/technical activities: 48%
- Manufacturing: 27%
- Information/communication: 31%
- Construction: 13%

Sample: 1,252 employed persons. Predicted probabilities based on an ordered logistic regression that controls for gender, age, education, Austrian citizenship and NUTS-2 region.
Results

Differences by education are smallish, in the multivariate model non-sig.

Perceived risk of infection with the Corona virus, by education

<table>
<thead>
<tr>
<th>Education</th>
<th>Very High</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory education</td>
<td>7%</td>
<td>22%</td>
</tr>
<tr>
<td>Apprenticeship</td>
<td>8%</td>
<td>23%</td>
</tr>
<tr>
<td>Vocational school</td>
<td>8%</td>
<td>24%</td>
</tr>
<tr>
<td>A-levels</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>Vocational A-levels</td>
<td>7%</td>
<td>21%</td>
</tr>
<tr>
<td>Lower tier tertiary</td>
<td>8%</td>
<td>24%</td>
</tr>
<tr>
<td>Tertiary degree</td>
<td>8%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Standard controls: gender, age, citizenship, household type, NUTS-2 region

<table>
<thead>
<tr>
<th>Education</th>
<th>Very High</th>
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<td>21%</td>
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<td>7%</td>
<td>18%</td>
</tr>
</tbody>
</table>
Results

Age gradient – highest perceived risk among those aged below 30

Perceived risk of infection with the Corona virus, by age

Standard controls: gender, education, citizenship, household type, NUTS-2 region

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>Very High</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>age 20-29</td>
<td>10%</td>
<td>28%</td>
</tr>
<tr>
<td>age 30-39</td>
<td>8%</td>
<td>23%</td>
</tr>
<tr>
<td>age 40-49</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>age 50-59</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>age 60-64</td>
<td>7%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Standard controls plus sector of activity

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>Very High</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>age 20-29</td>
<td>10%</td>
<td>27%</td>
</tr>
<tr>
<td>age 30-39</td>
<td>8%</td>
<td>24%</td>
</tr>
<tr>
<td>age 40-49</td>
<td>6%</td>
<td>20%</td>
</tr>
<tr>
<td>age 50-59</td>
<td>6%</td>
<td>19%</td>
</tr>
<tr>
<td>age 60-64</td>
<td>6%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Results

Where you are born matters – controlling for education and sector

Perceived risk of infection with the Corona virus, by country of birth

<table>
<thead>
<tr>
<th>Country</th>
<th>Very High</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Österreich</td>
<td>6%</td>
<td>22%</td>
</tr>
<tr>
<td>EU-15 plus CH</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Rest EU (mostly from Hungary, Romania, Croatia)</td>
<td>18%</td>
<td>36%</td>
</tr>
<tr>
<td>Rest of world</td>
<td>17%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Sample: 1,252 employed persons. Predicted probabilities based on an ordered logistic regression model.
Are women more exposed?

- Decomposition analysis – explaining away the gender effect
- The role played by the sector of activity
- The share of women/men at the workplace
- Gender differences within certain types of occupations
### Perceived risk of infection with the Coronavirus, by gender

**Standard controls:** gender, education, age, household type, NUTS-2 region, country of birth (=BASE model)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>DIFF:</th>
<th>OR:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BASE model</strong></td>
<td>28%</td>
<td>31%</td>
<td>3%-points</td>
<td>1.18 not sig</td>
</tr>
<tr>
<td>plus control for weekly working hours</td>
<td>26%</td>
<td>32%</td>
<td>6%-points</td>
<td>1.35*</td>
</tr>
<tr>
<td>plus control for firm size</td>
<td>26%</td>
<td>33%</td>
<td>7%-points</td>
<td>1.39**</td>
</tr>
<tr>
<td>plus control for homeoffice use</td>
<td>26%</td>
<td>32%</td>
<td>6%-points</td>
<td>1.35*</td>
</tr>
<tr>
<td>plus control for sector of activity</td>
<td>28%</td>
<td>31%</td>
<td>3%-points</td>
<td>1.16 not sig</td>
</tr>
<tr>
<td>plus control for share of females at workplace</td>
<td>28%</td>
<td>30%</td>
<td>2%-points</td>
<td>1.10 not sig</td>
</tr>
</tbody>
</table>

**KHB-Method**

Diff in OR when accounting for coef. inflation is: 1.26 (OR dropping from 1.39** to 1.10 ns)

### Predicted probability of (very) high risk perception
## Perception of risk of contracting COVID-19 at the workplace

by gender composition of workplaces (share of co-workers being male/female)

<table>
<thead>
<tr>
<th>Gender Composition</th>
<th>Somewhat high risk</th>
<th>Very high risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>mostly men</td>
<td>18%</td>
<td>5%</td>
</tr>
<tr>
<td>more men than women</td>
<td>21%</td>
<td>7%</td>
</tr>
<tr>
<td>balanced</td>
<td>21%</td>
<td>7%</td>
</tr>
<tr>
<td>more women than men</td>
<td>24%</td>
<td>8%</td>
</tr>
<tr>
<td>mostly women</td>
<td>28%</td>
<td>11%</td>
</tr>
</tbody>
</table>

*Shown are predicted probabilities of perceiving a (very) high risk based on an ordinal logistic regression model, that models the predictive value of the gender composition of workplaces, controlling for gender, age, education, country of birth, household type, weekly working hours, firm size, and home office use.*

No significant gender difference in risk perception. Gender composition of workplace matters!
Perception of risk of contracting COVID-19 at the workplace

by average level of risk perceived - grouping into low, medium and high risk sectors

low risk sectors (Manufacturing, ICT, Construction)

- Male: 16%
- Female: 22%

DIFF: 6%-points
OR: 1.59 not sig

medium risk sectors (Tourism, Transport, Public admin, fin services)

- Male: 27%
- Female: 24%

DIFF: 3%-points
OR: 0.86 not sig

high risk sectors (Education, retail, health/care)

- Male: 37%
- Female: 39%

DIFF: 3%-points
OR: 1.14 not sig

Shown are predicted probabilities of perceiving a (very) high risk based on an ordinal logistic regression model, controlling for gender, age, education, country of birth, household type, sector of activity, weekly working hours, firm size, and home office use.
Conclusion

• Risk perceived as rather **high in some sectors** (35% or more perceive high risk), even though data has been collected during a low incidence period.

• Risk perceived to be high by more than half of workers with **migrant background** (i.e., not born in Austria, Germany Italy or Switzerland). Persisting effect of migration status on risk perception.

• Risk perceived to be **highest in female dominated** essential industries (health care and social services, education and retail)

• Men and women **in comparable circumstances** perceive similar risks of infection – **no effect of gender** per se – **cognitive risk assessment**.
Appendix
Covid-19 as an occupational hazard

Theory

Education workers slightly lower exposure to disease and proximity to others